

REMARKS

Status of the Application

By the present Amendment, Applicants are amending claims 1 and 12. No new matter is added. Claims 1-29 are all the claims pending in the present application. Claims 4, 5, 11, and 15-26 have been withdrawn. Claims 1-3, 6-10, 12-14, and 27-29 have been rejected. The present Amendment addresses each point of rejection raised by the Examiner. Favorable reconsideration is respectfully requested.

Rejection Under 35 U.S.C. § 102(e) - Heidel

Claims 1 and 6 have been rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by U.S. Patent No. 5,212,707 to Heidel et al. (hereinafter "Heidel"). Applicants respectfully traverse this ground of rejection.

As the Examiner concedes, the lens-setting surface is not perpendicular to the optical axis in the Heidel reference (Office Action, page 2). As discussed in the Response of April 13, 2007, each end of the lens assembly of Heidel is attached to an inner surface of one of the ears 25, and this inner surface is parallel to the optical axis of the emitters 20. However, the Examiner maintains the rejection of claim 1 as allegedly being anticipated by Heidel, and argues that an end surface of the lens assembly "contacts the setting surface at the intersection (corner) of the inner portion and outer portion of #25 as can be seen in fig. 1" (Office Action, page 4). Applicants respectfully disagree.

The Examiner concedes that only the front surface of the ears 25 is perpendicular to the optical axis of the emitters 20, and that the end surface of the lens assembly is attached to the inner surface of each of the ears 25. However, the Examiner suggests that because the end surface of the lens assembly overlaps the corner of each ear 25, the end surface of the lens

assembly is “in contact with” the front surface of the ears 25, as recited in claim 1. Applicants submit that this interpretation would improperly eliminate any distinction between orthogonal surfaces. Even if the end surface of the lens assembly could be interpreted to be “in contact with” the corner, it is only in contact with the portion of the corner that is along the inner surface of the ear 25, not the portion of the corner that is along the front surface of the ear 25.

Therefore, Applicants maintain that Heidel fails to teach or suggest “a lens-setting surface which is flat, perpendicular to optical axes of said plurality of laser diodes, and located on a forward side of said plurality of laser diodes at a predetermined distance from said light-emission points, and said collimator-lens array is fixed to said block so that an end surface of the collimator-lens array is in contact with said lens-setting surface,” as recited in claim 1 (emphasis added). In particular, Applicants disagree with the Examiner’s assertion that the end surface of the lens assembly can be interpreted to be “in contact with” the front surface of the ears 25.

Accordingly, Applicants submit that claim 1 is patentable over Heidel at least by virtue of the aforementioned differences, as well as its additionally recited features. Claim 6 is a dependent claim including all of the elements of independent claim 1. Therefore, claim 6 is also patentable over Heidel at least by virtue of its dependency on claim 1, as well as its additionally recited features.

Rejection Under 35 U.S.C. § 103(a) - Heidel

Claims 12, 13 and 27-29 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Heidel.

Independent Claim 12

In the current Office Action, the Examiner argues that claim 12 does not require the lenses to be in contact with the reference surface. Applicants are amending claim 12 to specify that the collimator lenses are fixed on the reference surface.

As discussed above, Heidel fails to teach or suggest forming a reference surface that is perpendicular to optical axes of the plurality of laser diodes, adjusting positions of the plurality of collimator lenses along the reference surface, and fixing the plurality of collimator lenses at the adjusted positions on the reference surface. Therefore, claim 12 is patentable over Heidel for at least the aforementioned reasons, as well as its additionally recited features.

Independent Claim 13

Claim 13 recites a laser apparatus comprising a block which “has a reference surface which is flat, perpendicular to optical axes of said plurality of laser diodes, and located on a forward side of portions of said block to which said plurality of laser diodes are fixed,” wherein “said plurality of collimator lenses are fixed to said reference surface in such a manner that positions of the plurality of collimator lenses are adjusted along said reference surface.”

As discussed above, Heidel fails to teach or suggest any reference surface which is perpendicular to optical axes of the plurality of laser diodes, and to which the plurality of collimator lenses are fixed. Therefore, claim 13 is patentable over Heidel for at least the aforementioned reasons, as well as its additionally recited features.

Dependent Claims 27-29

Claim 27-29 are dependent claims including all of the elements of independent claim 1. Therefore, claims 27-29 are patentable over Heidel for at least the reasons discussed in relation to claim 1, as well as for their additionally recited features.

Rejection Under 35 U.S.C. § 103(a) - Heidel in view of Chiappetta

Claims 2 and 3 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Heidel in view of Chiappetta et al. (U.S. Patent No. 6,724,791; hereinafter “Chiappetta”). Applicants respectfully traverse this ground of rejection.

As discussed above, Heidel fails to teach or suggest all of the elements of independent claim 1. Chiappetta does not remedy the deficiencies of Heidel. Although Fig. 2 of Chiappetta discloses a laser module 12 which is in thermal contact with a flat surface 58 of a cooling element 16, there is no teaching or suggestion in Chiappetta of a flat lens-setting surface which is *perpendicular to optical axes of said plurality of laser diodes* and in contact with an end surface of the collimator-lens array, as required by claim 1.

At least by virtue of the aforementioned reasons, claim 1 is distinguished over Heidel in view of Chiappetta. Claims 2 and 3 are dependent claims including all of the elements of independent claim 1. Therefore, claims 2 and 3 are patentable over Heidel in view of Chiappetta for at least the aforementioned reasons based on their dependencies, as well as for their additionally recited features.

Rejection Under 35 U.S.C. § 103(a) - Heidel in view of Andrews ‘188, Andrews ‘535, and Kuniyasu

Claims 7-10 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Heidel in view of U.S. Patent Number 5,640,188 to Andrews (hereinafter “Andrews ‘188”) and further in view of U.S. Patent No. 5,432,535 to Andrews et al. (hereinafter “Andrews ‘535”) and U.S. Patent Application Publication No. 2002/0018499 to Kuniyasu et al. (hereinafter “Kuniyasu”). Applicants respectfully traverse this ground of rejection.

As discussed above, Heidel fails to teach or suggest all of the elements of independent claim 1. None of Andrews '188, Andrews '535, and Kuniyasu remedies the deficiencies of Heidel. Andrews '188 and Andrews '535 disclose multiple diode lasers affixed to surfaces and which allow for thermal dissipation. However, Andrews '188 and Andrews '535 both fail to teach or suggest a flat lens-setting surface which is perpendicular to optical axes of said plurality of laser diodes and in contact with an end surface of the collimator-lens array, as required by claim 1.

Kuniyasu discloses embodiments of a semiconductor laser with a plurality of layers formed on a substrate, and which achieves improved heat dissipation characteristics. However, Kuniyasu also fails to teach or suggest a flat lens-setting surface which is perpendicular to optical axes of said plurality of laser diodes and in contact with an end surface of the collimator-lens array, as required by claim 1.

At least by virtue of the aforementioned reasons, claim 1 is distinguished over Heidel in view of Andrews '188, Andrews '535, and Kuniyasu. Claims 7-10 are dependent claims including all of the elements of independent claim 1. Therefore, claims 7-10 are patentable over Heidel in view of Andrews '188, Andrews '535, and Kuniyasu for at least the aforementioned reasons based on their dependencies, as well as for their additionally recited features.

Rejection Under 35 U.S.C. § 103(a) - Heidel in view of Andrews '188 and Kuniyasu

Claim 14 has been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Heidel in view of Andrews '188 and Kuniyasu. Applicants respectfully traverse this ground of rejection.

As discussed above, none of Heidel, Andrews '188 and Kuniyasu, alone or in combination, teaches or suggests all of the elements of independent claim 13. In particular, these

references fail to teach or suggest any reference surface which is perpendicular to optical axes of the plurality of laser diodes, and to which the plurality of collimator lenses are fixed, as required by claim 13.

At least by virtue of the aforementioned reasons, claim 13 is distinguished over Heidel in view of Andrews '188 and Kuniyasu. Claim 14 is a dependent claim including all of the elements of independent claim 13. Therefore, claim 14 is patentable over Heidel in view of Andrews '188 and Kuniyasu for at least the aforementioned reasons based on its dependency, as well as for its additionally recited features.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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